

SECTION 15010 - MILL PIPING - EXPOSED AND BURIED

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing small steel pipe, stainless steel pipe and tubing, red brass pipe, copper pipe and tubing, solvent-welded PVC pipe, CPVC pipe, fiber glass reinforced plastic pipe, process glass pipe, cast iron soil pipe, and corrosion-resistant cast iron pipe with fittings, gaskets, bolts, insulating connections, pipe insulation, and other specialties required for an operable piping system.

1.2 RELATED SECTIONS

- A. The WORK of the following Section applies to the WORK of this Section. Other Sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 15000 Piping Components

1.3 SPECIFICATIONS AND STANDARDS

- A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

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| 1. | ANSI/ASME B16.3 | Malleable Iron Threaded Fittings, Classes 150 and 300 |
| 2. | ANSI/ASME B16.4 | Cast Iron Threaded Fittings, Class 125 and 250 |
| 3. | ANSI B16.5 | Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys |
| 4. | ANSI B16.11 | Forged Steel Fittings, Socket-Welding and Threaded |
| 5. | ANSI B16.12 | Cast-Iron Threaded Drainage Fittings |
| 6. | ANSI/ASME B16.15 | Cast Bronze Threaded Fittings, Classes 125 and 250 |
| 7. | ANSI B16.21 | Nonmetallic Flat Gaskets for Pipe Flanges |
| 8. | ANSI B16.22 | Wrought Copper and Copper Alloy Solder Joint Pressure Fittings |
| 9. | ANSI/ASME B16.24 | Cast Copper Alloy Pipe Flanges and Flanged Fittings |
| 10. | ASTM A 53 | Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless |
| 11. | ASTM A 74 | Specification for Cast Iron Soil Pipe and Fittings |
| 12. | ASTM A 105 | Specification for Forgings for Piping Components |

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| 13. | ASTM A 106 | Specification for Seamless Carbon Steel Pipe for High Temperature Service |
| 14. | ASTM A 269 | Specification for Seamless and Welded Ferritic and Martensitic Stainless Steel Tubing for General Service |
| 15. | ASTM A 312 | Specification for Seamless and Welded Austenitic Stainless Steel Pipe |
| 16. | ASTM A 518 | Specification for Corrosion-Resistant High-Silicon Iron Castings |
| 17. | ASTM B 42 | Specification for Seamless Copper Pipe, Standard Sizes |
| 18. | ASTM B 43 | Specification for Seamless Red Brass Pipe, Standard Sizes |
| 19. | ASTM B 62 | Specification for Composition Bronze or Ounce Metal Castings |
| 20. | ASTM B 88 | Specifications for Seamless Copper Water Tube |
| 21. | ASTM C 599 | Specification for Process Glass Pipe and Fittings |
| 22. | ASTM D 1785 | Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120 |
| 23. | ASTM D 2996 | Specification for Filament-Wound Reinforced Thermosetting Resin Pipe |
| 24. | ASTM D 4101 | Specification for Propylene Plastic Injection and Extrusion Materials |
| 25. | ASTM F 441 | Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80 |

1.4 SHOP DRAWINGS AND SAMPLES

- A. The following shall be submitted in compliance with Section 01300:
 - 1. Manufacturer's product specifications and performance information.

PART 2 -- PRODUCTS

2.1 SMALL STEEL PIPE

- A. Unless otherwise indicated, galvanized steel pipe and black steel pipe in sizes 6 inches in diameter and smaller shall conform to the requirements of ASTM A 53 and ASTM A 106 and shall be Schedule 40 or 80 as indicated. Fittings for galvanized steel pipe shall be of galvanized malleable iron, with NPT or grooved ends as indicated. Black pipe may have welded joints, with standard or extra strong welded fittings unless otherwise indicated in the Piping Schedule.
- B. Black steel pipe for chlorine and sulfur dioxide pressure service, when indicated, shall conform to Chlorine Institute Pamphlet 6 and shall be ASTM A 106, Grade A or B, Schedule 80. Except where

required to match mating fittings of vacuum regulator-check units, gas filters, valves, and protective diaphragms for gages and switches, fittings shall be socket welded. Socket welded fittings shall conform to ASTM A 105, Grade 2 and ANSI B16.11, 300 lb, forged carbon steel. Bushings will not be allowed.

- C. Flanges for chlorine and sulfur dioxide service shall conform to ASTM A 105, ANSI B16.5, Class 300 and shall be 1/16-inch raised face.
- D. Unions for chlorine and sulfur dioxide service shall be four bolt tongue and groove, ammonia type, suitable for chlorine or sulfur dioxide service. Unions shall have female thread and connection and matched tongue and groove flanges employing a lead gasket. High tensile alloy steel corrosion-resistant bolts and nuts shall be used with each set of flanged unions. Unions shall be rated for 500 lb CWP service pressure. Reducing-type, straight-type or blind-type unions, as required for the installation shall be provided. Blind unions shall be provided as cleanouts where indicated. A straight union adjacent to each threaded valve or piece of equipment shall be provided.
- E. Gaskets for chlorine and sulfur dioxide service flanges shall be 1/16-inch, high temperature compressed self-centering ring type conforming to ANSI B16.21.

2.2 STAINLESS STEEL PIPE

- A. Unless otherwise indicated, stainless steel pipe shall be Type 316 Schedule 40 threaded pipe conforming to ASTM A 312 with stainless steel threaded fittings, or with stainless steel welded fittings, where indicated. Lightweight stainless steel pipe shall be Type 316 Schedule 10 pipe conforming to ASTM A 312, with stainless steel welding fittings.

2.3 STAINLESS STEEL TUBING

- A. Stainless steel tubing shall be made of Type 316 L stainless steel to the requirements of ASTM A 269, of minimum 1/4-inch inside diameter, or as indicated, for the test pressure required. The fittings shall be swage ferrule design of Type 316 L stainless steel, of the double acting ferrule design, providing both a primary seal and a secondary bearing force. Flare bite or compression type fittings are not acceptable.

2.4 RED BRASS PIPE

- A. Brass pipe shall conform to the requirements of ASTM B 43. Fittings shall be of bronze conforming to the requirements of ASTM B 62 with threaded ends, conforming to ANSI/ASME B16.15.

2.5 COPPER PIPE

- A. Copper pipe shall be hard drawn, to the requirements of ASTM B 42, with regular or extra strong wall thickness, as required for the test pressure. Copper pipe shall have screwed ends for NPT fittings, or brazed joints. The fittings shall be threaded cast bronze fittings to the requirements of ANSI/ASME B16.15, class 125 or 250, as required, or flanged cast copper alloy fittings to the requirements of ANSI/ASME B16.24, with 150 lbs rating, or as required.

2.6 COPPER TUBING

- A. Copper tubing shall conform to the requirements of ASTM B 88 and shall be Type K, soft temper for buried tubing and hard drawn for above-ground application. Fittings shall be soldered or sweated on and shall be of wrought copper conforming to ANSI B16.22. Soldered joints shall

contain 95-percent tin and 5-percent antimony. For oxygen service, joints shall be made with silver solder. No solders or fluxes containing more than 0.2 percent of lead shall be used.

2.7 POLYVINYL CHLORIDE PRESSURE PIPE, SOLVENT-WELDED

- A. Polyvinyl chloride pressure pipe shall be made from all new rigid unplasticized polyvinyl chloride and shall be Normal Impact Class 12454-B, Schedule 80, conforming to ASTM D 1785, unless otherwise indicated. Elbows and tees shall be of the same material as the pipe. Joint design shall be for solvent-welded construction.

2.8 CHLORINATED POLYVINYL CHLORIDE PRESSURE PIPE, SOLVENT-WELDED

- A. Chlorinated polyvinyl chloride pressure pipe, for hot, corrosive solutions and where indicated, shall be made from all new rigid unplasticized chlorinated polyvinyl chloride, Class 23447-B, and shall be Schedule 80 conforming to ASTM F 441, with solvent-welded fittings of the same material as the pipe.

2.9 POLYPROPYLENE PIPE

- A. Polypropylene pipe, for chemical drains and where indicated, shall be Type 1, Schedule 80 pipe conforming to ASTM D 4101, with drainage pattern fittings made of the same material and shall be joined by the thermo-seal fusion process, or by threading, or flanging.

2.10 PROCESS GLASS PIPE

- A. Process glass pipe, for chemical drains and where indicated, shall be made of chemically resistant, low-expansion Type 1 borosilicate glass with conical ends and drainage fittings of the same material as the pipe, with compression couplings and Teflon joints, conforming to ASTM C 599. Where concealed or buried, process glass pipe shall be armored with a factory-applied protective jacket of polystyrene, or similar material.

2.11 FIBERGLASS REINFORCED PLASTIC PIPE

- A. Fiberglass reinforced plastic pipe shall be machine-made reinforced thermosetting resin pressure pipe, manufactured by the filament winding process conforming to ASTM D 2996, suitable for exposed or buried service. Unless otherwise indicated, it shall be made of epoxy resins and continuous glass filaments, wound together over a resin-rich reinforced liner, with fittings made of the same material. The pipes shall have adhesive-bonded bell and spigot joints or flanged connections, and shall be suitable for operating pressures of 175 psig at temperatures up to 200 degrees F, or for temperatures up to 300 degrees F at derated pressures.

2.12 CAST IRON SOIL PIPE

- A. Cast iron soil pipe and fittings shall be made of gray cast iron, service weight, conforming to ASTM A 74, suitable for service in drainage, waste, vent, and sewer lines. The pipes and fittings shall have caulked lead bell and spigot joints, or hubless joints with stainless steel couplings over suitable elastomer sleeves.

2.13 CORROSION-RESISTANT CAST IRON SOIL PIPE

- A. Corrosion-resistant cast iron soil pipe and fittings shall be made of high-silicon cast iron conforming to ASTM A 518, service weight, suitable for chemical drains and vents. The pipes and fittings shall

have caulked lead bell and spigot joints, or hubless joints with stainless steel couplings over suitable elastomer sleeves.

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. **General:** Mill piping shall be installed in accordance with the manufacturer's installation instructions.
- B. **Small Steel Pipe:** Buried galvanized or black steel pipe shall be coated in accordance with Section 09800 or with an extruded high density polyethylene coating with minimum thickness of 35 mils.
- C. **Plastic Pipe:** PVC, CPVC, and FRP pipe joints shall be solvent-welded in accordance with the manufacturer's instructions. Expansion joints or pipe bends shall be installed to absorb pipe expansion over a temperature range of [100] [] degrees F, unless otherwise indicated. Care shall be taken to provide sufficient supports, anchors, and guides, to eliminate stress on the piping.

3.2 CONTINUITY BONDS

- A. Where indicated, metallic pipe joints, except field-welded joints and insulating joints, shall be continuity bonded in accordance with Section 15025 or as indicated on the drawings.

**** END OF SECTION****